IN THE CLAIMS

Please amend Claims 1 and 7 as follows:

1. A method of locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel;

evaluating reflections of said acoustic energy [as a function of propagation of said energy within] from said tissue and said blood vessel, and

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to said blood vessel.

7. A method of [detecting] locating at least one wall of a blood vessel, comprising:

transmitting acoustic energy into the blood vessel;

detecting at least one region associated with the lumen in said blood vessel; and

detecting the location of said at least one wall of the blood vessel relative to said lumen;

wherein the act of detecting the location comprises analyzing A-mode data derived from said act of transmitting.

Additionally, please add Claims 10-40 as follows:

10. The method of Claim 1, wherein the act of identifying comprises:

determining a power metric from said reflections;

integrating said power metric to produce a power function;

normalizing said power function;

dividing said normalized power function into a plurality of intervals; and

evaluating at least one of said intervals to identify said artifact.

11. The method of Claim 7, wherein the act of detecting at least one region comprises analyzing the power of reflected by said blood vessel and associated lumen as a function of position.

12. The method of Claim 7, wherein the act of detecting the location comprises analyzing said A-mode data for variations in reflected power in at least one location relative to said lumen.

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13. The method of Claim 12, wherein said act of analyzing said A-mode data for variations comprises comparing the reflected power in said at least one location to that associated with said lumen.

14. The method of Claim 13, wherein said act of comparing comprises comparing the reflected power corresponding to said at least one location to the mean power associated with at least a portion of said lumen.

15. The device of Claim 9, further comprising at least one second transducer adapted to generate second signals relating to the pressure on at least one face thereof.

16. The device of Claim 15, wherein said first signals are further utilized to determine a transfer function, said transfer function being used to correct said pressure measured by said at least one second transducer.

17. The device of Claim 9, wherein said processor is configured to analyze the integrated power profile associated with said echoes in order to determine the location of said lumen.

18. The device of Claim 9, wherein said processor is configured to analyze the signal level of said echoes in order to determine the location of said lumen.

19. Blood vessel locating apparatus, comprising:

at least one transducer capable of transmitting an acoustic wave into a blood vessel and receiving a plurality of echoes therefrom, said first transducer configured to generate first signals related to said echoes; and

a processor, operatively connected to said first transducer, and configured to process said first signals to determine the location of the lumen of said blood vessel.

20. The apparatus of Claim 19, wherein said processor is adapted to determine a power profile associated with said echoes, and identify at least one artifact therein, said at least one artifact corresponding at least in part to said lumen.

21. The apparatus of Claim 20, wherein said power profile is integrated over a variable corresponding to the propagation of said acoustic wave, and said at least one artifact comprises a plateau within said integrated power profile.

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22. The apparatus of Claim 19, wherein said processor is adapted to determine the Doppler shift associated with blood present in said blood vessel.

23. The apparatus of Claim 19, wherein said processor is adapted to compare the signal level of at least a portion of said echoes and identify at least one artifact therein.

24. The apparatus of Claim 23, wherein said signal level comprises an envelope-squared metric, and said at least one artifact comprises a reduction in the magnitude of said envelope-squared metric, said reduction corresponding to said lumen of said blood vessel.

25. An information storage device, comprising;

a data storage medium;

a plurality of data stored on said medium, said plurality of data comprising a computer program adapted to run on a data processor, said computer program being configured for:

initiating the transmission of acoustic energy into the tissue of a subject including said blood vessel;

evaluating reflections of said acoustic energy from said tissue, and

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to a blood vessel.

26. The information storage device of Claim 25, wherein said computer program is adapted to generate a plurality of A-mode lines based on said reflections.

27. The information storage device of Claim 25, wherein said computer program is adapted to identify said at least one region of reduced energy reflection by integration of the power reflected by said tissue, including said blood vessel, said integration including at least one artifact indicative of the lumen of said blood vessel.

28. A method of positioning a device with respect to a blood vessel of a subject, comprising:

positioning an acoustic energy source with respect to said blood vessel;

transmitting acoustic energy from said source into said blood vessel;

receiving reflections of said acoustic energy from said blood vessel,

determining the relative wall positions of said blood vessel based on said received reflections; and

positioning said device with respect to said blood vessel based at least in part on said relative wall positions.

29. The method of Claim 28, wherein said act of determining the wall relative positions comprises:

detecting the lumen of said blood vessel;

evaluating said received reflections to identify a first wall relative to said lumen; and

evaluating said received reflections to identify a second wall relative to said lumen.

30. The method of Claim 29, further comprising determining the diameter of said blood vessel based on said identification of said first and second walls, and wherein the act of positioning said device with respect to said blood vessel comprises positioning said acoustic energy source so as to maintain said value of said diameter substantially at a predetermined value, the position of said device bearing some known relationship to the position of said acoustic energy source.

31. The method of Claim of Claim 30, wherein said act of maintaining said diameter substantially at a predetermined value comprises maintaining said value substantially maximized.

32. A method of positioning a device with respect to a blood vessel of a subject, comprising:

positioning an acoustic energy source with respect to said blood vessel;

transmitting acoustic energy from said source into said blood vessel;

receiving reflections of said acoustic energy from said blood vessel;

detecting the lumen associated with the blood vessel; and

positioning said device with respect to said blood vessel based at least in part on said lumen position.

33. The method of Claim 32, wherein the act of detecting the lumen comprises:

identifying at least one artifact within the integrated power profile of said received reflections, said at least one artifact corresponding to said lumen.

34. The method of Claim 33, wherein the act of identifying at least one artifact comprises:

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determining a power metric;

integrating said power metric to produce a power function;

normalizing said power function;

dividing said normalized power function into a plurality of intervals; and

evaluating at least one of said intervals to identify said artifact.

35. The method of Claim 34, wherein said act of determining a power metric comprises deriving a metric based on an envelope-squared function.

36. A method of locating a blood vessel disposed within surrounding tissue, comprising the steps of:

transmitting acoustic energy into said tissue including said blood vessel to generate reflections thereof;

receiving said reflections of said acoustic energy from said tissue and said blood vessel;

forming at least one integrated power representation to identify at least one region of reduced energy reflection within said tissue, said at least one region corresponding to the lumen of said blood vessel; and

locating said blood vessel based on the location of said lumen.

37. Blood vessel locating apparatus, comprising:

transducer means adapted for transmitting an acoustic wave into a blood vessel and receiving a plurality of echoes therefrom, said transducer means configured to generate first signals related to said echoes; and

means for data processing operatively connected to said first transducer and configured for processing said first signals; and

computer program means adapted to run on said means for data processing, said computer program means further being adapted to determine the location of the lumen of said blood vessel based on a power profile derived at least in part from said first signals.

38. Blood vessel locating apparatus, comprising:

at least one transducer capable of transmitting an acoustic wave into a blood vessel and receiving a plurality of echoes therefrom, said first transducer configured to generate first signals related to said echoes;

at least one signal converter, operatively coupled to said at least one transducer and adapted to produce second signals from said first signals;

at least one digital processor, operatively coupled to said analog-to-digital converter, and configured to process said second signals; and

a computer program running at least in part on said digital processor, said computer program being adapted to determine a power profile based on said second signals, and to determine the location of the lumen of said blood vessel based at least in part on one or more artifacts present within said power profile.

39. A method of providing treatment to a living subject, comprising:

locating at least one blood vessel of said subject, said act of locating comprising locating the lumen associated with said at least one blood vessel by identifying at least one artifact within the integrated power profile of reflected acoustic energy transmitted into said blood vessel;

monitoring the blood pressure within said at least one blood vessel non-invasively; and

providing treatment to said subject based at least in part on said act of monitoring.

40. A method of providing treatment to a living subject, comprising:

locating at least one blood vessel of said subject, said act of locating comprising: